

RECEIVED 1 of 7

JUN 2 1 2001

TECH CENTER 1600/2900 1652

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/508,418

DATE: 05/21/2001 TIME: 09:50:59

Input Set : A:\Q58140.txt

Output Set: N:\CRF3\05212001\I508418.raw



3 <110> APPLICANT: Nihon Nohyaku Co., Ltd.
5 <120> TITLE OF INVENTION: NOVEL PROTOPORPHYRINOGEN OXIDASE TOLERANT TO PHOTOBLEACING HERBICIDE
7 <130> FILE REFERENCE: Q58140
9 <140> CURRENT APPLICATION NUMBER: 09/508,418
C> 10 <141> CURRENT FILING DATE: 2000-06-08
12 <150> PRIOR APPLICATION NUMBER: JP 9-265084
13 <151> PRIOR FILING DATE: 1997-09-11
15 <160> NUMBER OF SEQ ID NOS: 11
17 <170> SOFTWARE: PatentIn version 3.0
19 <210> SEQ ID NO: 1
20 <211> LENGTH: 1874
21 <212> TYPE: DNA
22 <213> ORGANISM: Nicotiana tabacum
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25 <221> NAME/KEY: exon
26 <222> LOCATION: (26)(1672)
28 <220> FEATURE:
29 <221> NAME/KEY: misc_feature
30 <223> OTHER INFORMATION: Strain name: Xanthi NC 33 <400> SEQUENCE: 1
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36 1 5
38 cct aat att ttc act cac cag tcg tcg tca tcg cca ttg gca ttc tta 100
39 Pro Asn Ile Phe Thr His Gln Ser Ser Ser Pro Leu Ala Phe Leu
40 10 15 20 25
42 aac egt aeg agt tte ate eet tte tet tea ate tee aag ege aat agt 148
43 Asn Arg Thr Ser Phe Ile Pro Phe Ser Ser Ile Ser Lys Arg Asn Ser
44 30 35 40
46 gtc aat tgc aat ggc tgg aga aca cga tgc tcc gtt gcc aaa gat tac 196
47 Val Asn Cys Asn Gly Trp Arg Thr Arg Cys Ser Val Ala Lys Asp Tyr
48 45 50 55
50 aca gtt cet tee tea geg gte gae gge gga eee gee geg gag etg gae 244
51 Thr Val Pro Ser Ser Ala Val Asp Gly Gly Pro Ala Ala Glu Leu Asp
52 60 65 70
54 tgt gtt ata gtt gga gca gga att agt ggc ctc tgc att gcg cag gtg 292
55 Cys Val Ile Val Gly Ala Gly Ile Ser Gly Leu Cys Ile Ala Gln Val
56 75 80 85
58 atg tcc gct aat tac ccc aat ttg atg gta acc gag gcg aga gat cgt 340
59 Met Ser Ala Asn Tyr Pro Asn Leu Met Val Thr Glu Ala Arg Asp Arg
60 90 95 100 105
62 gcc ggt ggc aac ata acg act gtg gaa aga gac ggc tat ttg tgg gaa 388
63 Ala Gly Gly Asn Ile Thr Thr Val Glu Arg Asp Gly Tyr Leu Trp Glu
64 110 115 120
66 gaa ggt ccc aac agt ttc cag ccg tcc gat cct atg ttg act atg gca 436
67 Glu Gly Pro Asn Ser Phe Gln Pro Ser Asp Pro Met Leu Thr Met Ala
68 125 130 135

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.75 76	Pro	Arg 155	Phe	Val	Leu	Trp	Lys 160	Gly	Lys	Leu	Arg	Pro 165	Val	Pro	tca Ser	Lys	532
79 80	Leu 170	Thr	qzA	Leu	Pro	Phe 175	Phe	Asp	Leu	Met	Ser 180	Ile	Pro	Gly	aag Lys	Leu 185	580
83 84	Arg	Ala	Gly	Phe	Gly 190	Pro	Ile	Gly	Leu	Arg 195	Pro	Ser	Pro	Pro	ggt Gly 200	His	628
87 88	Glu	Glu	Ser	Val 205	Glu	Gln	Phe	Val	Arg 210	Arg	Asn	Leu	Gly	Gly 215	gaa Glu	Val	676 .
91 92	Phe	Glu	Arg 220	Leu	Ile	Glu	Pro	Phe 225	Cys	Ser	Gly	Val	Tyr 230	Ala	ggt Gly	Asp	724
94 95 96	ccc Pro	tca Ser 235	aaa Lys	ctg Leu	agt Ser	atg Met	aaa Lys 240	gca Ala	gca Ala	ttt Phe	ggg Gly	aaa Lys 245	gtt Val	tgg Trp	aag Lys	ttg Leu	772
99	gaa Glu 250	Glu	act Thr	ggt Gly	ggt Gly	agc Ser 255	Ile	att Ile	gga Gly	gga Gly	acc Thr 260	Phe	aaa Lys	gca Ala	ata Ile	aag Lys 265	820
102 103 104	Glu	g aga ı Arg	tco Ser	agt Ser	aca Thr	Pro	aaa Lys	gcg Ala	g ccc a Pro	c cgc Arg 275	g Asg	ccg Pro	g cgt o Arg	tta J Leu	cct Pro 280	aaa Lys	868
106 107 108	7 Pro	aaa Lys	gga Gly	cag Gln 285	Thr	gtt Val	gga Gly	tca Sei	tto Phe 290	e Arc	g aag g Lys	g ggt s Gly	t cto / Leu	aga Arg 295	, Met	ctg Leu	916
110 113 112	l Pro	gat Asp	gca Ala 300	Ile	agt Ser	gça Ala	aga Arg	tto Lei 305	ı Gly	a ago 7 Sei	c aaa C Lys	tta Lei	a aaa u Lys 310	: Lei	tca Ser	tgg Trp	964
114 115 116	5 Lys	ctt Leu 315	Ser	ago Ser	att Ile	act Thr	aag Lys 320	Sei	gaa Glu	a aaa 1 Lys	a gga s Gly	gga Gly 325	у Туг	cac His	ttg Leu	aca Thr	1012
119	3 tac 7 Tyr 3 330	Glu	aca Thr	cca Pro	gaa Glu	gga Gly 335	v Val	gtt Val	tct Ser	ctt Leu	caa Glr 340	Set	t cga	a ago g Ser	att Ile	gtc Val 345	1060
	8 Met					Tyr					ı Ile					tcg Ser	1108
126 127 128	Val	geo Ala	gca Ala	gca Ala 365	Asp	gca Ala	ctt Leu	tca Ser	a aat Asr 370) Phe	tac Tyr	tat Tyi	r Pro	c cca Pro 375	Val	gga Gly	1156
130) gca L Ala			Ile					ı Glı					Glu		ctg Leu	1204
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									tat								1300
		val	GIU	Thr	Leu		Thr	пе	Tyr	Ser		Ser	Leu	Pne	Pro		
	410					415					420					425	
									ctc	_						-	1348
	Arg	Ala	Pro	Lys	_	Arg	Val	Leu	Leu		Asn	Tyr	Ile	GIY	-	Ala	
144					430					435					440		
									acg								1396
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156		475					480					485					
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		Val	Gly	His	Leu		Thr	Leu	Ser	Thr		Lys	Ala	Ala	Met	Asn	
	490					495					500					505	
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164					510					515					520		
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167	Val	Ala	Leu	Gly	Arg	Cys	Val	Glu	Gly	Ala	Tyr	Glu	Val	Ala	Ser	Glu	
168				525					530					535			
170	gta	aca	gga	ttt	ctg	tct	cgg	tat	gca	tac	aaa	tga	aaco	tgt	jt t		1682
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198	Ser	Ser	Ser	Ser	Pro	Leu	Ala	Phe	Leu	Asn	Arg	Thr	Ser	Phe	Ile	Pro	
199				20					25					30			
201	Phe	Ser	Ser	Ile	Ser	Lys	Arg	Asn	Ser	Val	Asn	Cys	Asn	Gly	Trp	Arg	
202			35					40					45	_	-		
204	Thr	Arg	Cys	Ser	Val	Ala	Lys	Asp	Tyr	Thr	Val	Pro	Ser	Ser	Ala	Val	
205		50					55					60					

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	Ile	Ser	Gly	Leu	_		Ala	Gln	Val			Ala	Asn	Tyr		
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213 214	Leu	Met	Val	Thr 100	Glu	Ala	Arg	Asp	Arg 105	Ala	Gly	Gly	Asn	Ile 110	Thr	Thr
216	Val	Glu	Arq	Asp	Glv	Tvr	Leu	Trp	Glu	Glu	Gly	Pro	Asn	Ser	Phe	Gln
217			115					120					125			
219	Pro	ser 130	Asp	Pro	Met	Leu	135	Met	Ala	vaı	Asp	140	GTĀ	Leu	гàг	Asp
222	Asp	Leu	Val	Leu	Gly	Asp	Pro	Asn	Ala	Pro	Arg	Phe	Val	Leu	Trp	Lys
223	145					150					155					160
225	Gly	Lys	Leu	Arg	Pro	Val	Pro	Ser	Lys	Leu	Thr	Asp	Leu	Pro	Phe	Phe
226					165					170					175	
228	Asp	Leu	Met	Ser	Ile	Pro	Gly	Lys	Leu	Arg	Ala	Gly	Phe	Gly	Pro	Ile
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231	Gly	Leu	Arg	Pro	Ser	Pro	Pro	Gly	His	Glu	Glu	Ser	Val	Glu	Gln	Phe
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237	Phe	Cys	Ser	Gly	Val	Tyr	Val	Gly	Asp	Pro	Ser	Lys	Leu	Ser	Met	Lys
	225					230					235					240
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243	Ile	Gly	G1y	Thr	Phe	Lys	Ala	Ile	Lys	Glu	Arg	Ser	Ser	Thr	Pro	Lys
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246	Ala	Pro	Arg	Asp	Pro	Arg	Leu	Pro	Lys	Pro	Lys	Gly	Gln	Thr	Val	Gly
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255	Ser	Glu	Lys	Gly	Gly	Tyr	His	Leu	Thr	Tyr	Glu	Thr	Pro	Glu	Gly	Val
256					325					330					335	
258	Val	Ser	Leu	Gln	Ser	Arg	Ser	Ile	Val	Met	Thr	Val	Pro	Ser	Tyr	Val
259				340					345					350		
261	Ala	Ser	Asn	Ile	Leu	Arg	Pro	Leu	Ser	Val	Ala	Ala	Ala	Asp	Ala	Ĺeu
262			355					360					365			
264	Ser	Asn	Phe	Tyr	Tyr	Pro	Pro	Val	Gly	Ala	Val	Thr	Ile	Ser	Tyr	Pro
265		370					375					380				
267	Gln	Glu	Ala	Ile	Arg	Asp	Glu	Arg	Leu	Val	Asp	Gly	Glu	Leu	Lys	Gly
268	385					390					395					400
270	Phe	Gly	Gln	Leu	His	Pro	Arg	Thr	Gln	Gly	Val	Glu	Thr	Leu	Gly	Thr
271					405					410					415	
273	Ile	Tyr	Ser	Ser	Ser	Leu	Phe	Pro	Asn	Arg	Ala	Pro	Lys	_	Arg	٧al
274				420					425					430		
276	Leu	Leu		Asn	Tyr	Ile	Gly		Ala	Lys	Asn	Pro		Ile	Leu	Ser
277			435					440					445			
279	Lys	Thr	Glu	Ser	Gln	Leu	Val	Glu	Val	Val	Asp	Arg	Asp	Leu	Arg	Lys

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285	Val	Trp	Pro	Gln	Ala	Ile	Pro	Gln	Phe	Leu	Val	Gly	His	Leu	Asp	Thr		
286					485					490					495			
288	Leu	Ser	Thr	Ala	Lys	Ala	Ala	Met	Asn	Asp	Asn	Gly	Leu	Glu	Gly	Leu		
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291	Phe	Leu	Gly	Gly	Asn	Tyr	Val	Ser	Gly	Va1	Ala	Leu	Gly	Arg	Cys	Val		
292			515	_		_		520					525					
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	cct	aat	att	tta	act	cac	caσ	_	tca	tca	tca	-	ttα	αca	ttc	tta	1	.00
	Pro																	
	10	ASII	116	riic	1111	15	0111	DCI	001	001	20		200			25		
	aac	aat	200	a art	++0		cct	tto	tet	tca		tcc	ааσ	cac	aat		. 1	.48
323	Asn	7 mar	mbr.	cor	Dho	Tla	Dro	Dho	Sor	Cor	TIA	Ser	Lve	Δra	Agn	Ser	-	
325		Arg	TIII	Ser	30	116	FIU	FIIC	261	35	110	JCI	шys	111.9	40	001		
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227	Val	aat Aan	Crra	aa L	21v	Trn	aya	Thr	Ara	Cve	Sar	Val	λla	Lve	Δen	Tyr	-	
		ASII	Cys	45	GIY	пр	ALG	TIIT	50	Cys	Ser	vui	AIG	55	пор	-1-		
329					+		: ~+ ~	~~~		~~~	000		aoa		c+ a	asc.	2	44
331	aca Thr	get	CCL	CCC	Com	geg	guc	yac	21	Clar	Dro	312	31 a	Clu	Lou	Acn.		111
		vaı		ser	ser	Ald	Val		GTÀ	GTÄ	PIU	HIA	70	Gra	nea	nsp		
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	Met	Ser	Ala	Asn	Tyr		Asn	Leu	Met	vaı		GIU	Ата	Arg	ASP			
	90					95					100				+	105	2	00
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VERIFICATION SUMMARY

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L:10 M:271 C: Current Filing Date differs, Replaced Current Filing Date